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University of Montana Report of the President 1899-1900

University of Montana (Missoula, Mont.). Office of the President

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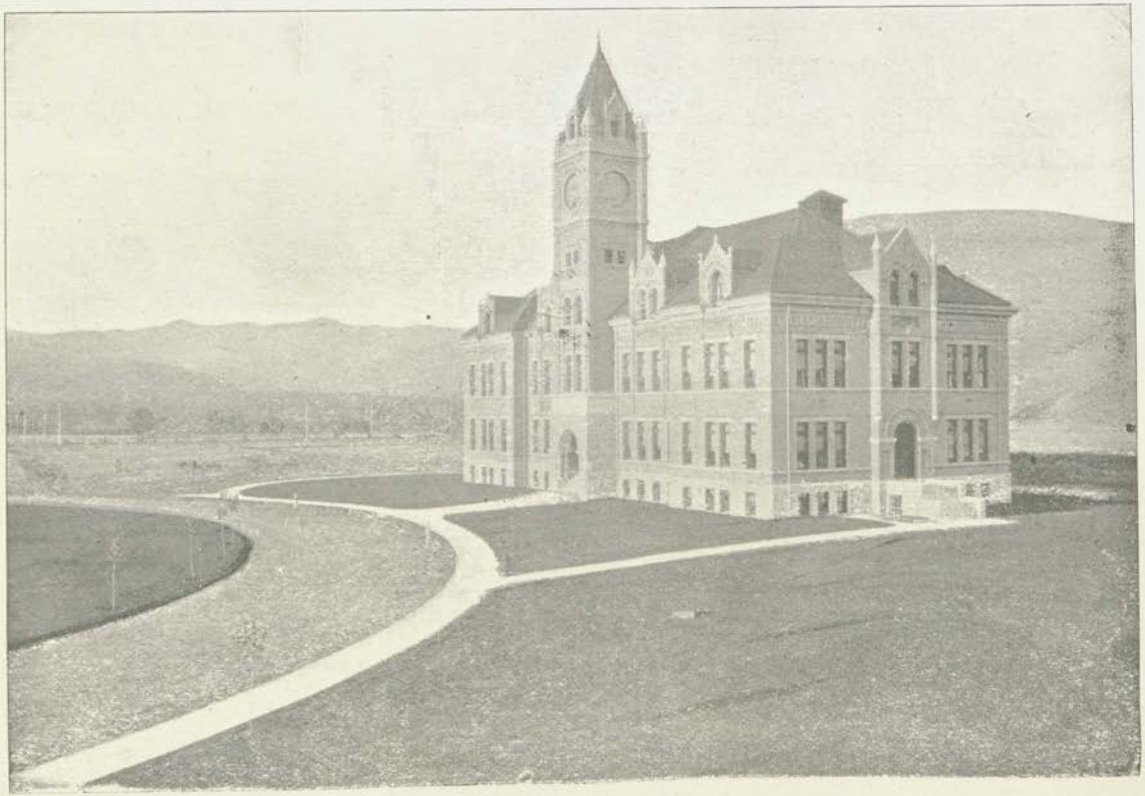
UNIVERSITY OF MONTANA

ANNUAL REPORT OF THE PRESIDENT

1899-1900



UNIVERSITY HALL.

THE

Sixth Annual Report

OF THE

PRESIDENT OF THE

University of Montana

TO THE

Montana State Board of Education.

1900.
STATE PUBLISHING CO.
STATE STATIONERS, PRINTERS AND BINDERS.
HELENA, MONT.

Montana State Board of Education.

EX-OFFICIO.

GOVERNOR ROBERT B. SMITH, President.
C. B. NOLAN, Attorney General.
E. A. CARLETON, Supt. Pub. Instruction, Secretary.

APPOINTED.

O. P. CHISHOLM, Bozeman	Term Expires	February	1st,	1900
J. G. McKAY, Hamilton	"	"	"	"	1900
HENRY R. MELTON, Dillon	"	"	"	"	1901
M. J. GARRETT, Helena	"	"	"	"	1901
J. M. HAMILTON, Missoula	"	"	"	"	1902
J. P. HENDRICKS, Butte	"	"	"	"	1902
N. W. McCONNELL, Helena	"	"	"	"	1903
O. F. GODDARD, Billings	"	"	"	"	1903

SARA B. MACLAY ..... Clerk of the Board

EXECUTIVE COMMITTEE OF THE STATE UNIVERSITY.

J. H. T. RYMAN, President ..... Missoula
T. C. MARSHALL, Secretary ..... Missoula
HIRAM KNOWLES ..... Missoula

THE FACULTY.

OSCAR J. CRAIG, A. M., Ph. D., President,
Professor of History.

CYNTHIA ELIZABETH REILEY, B. S.,
Professor of Mathematics.

W. M. ABER, A. B.,
Professor of Latin and Greek.

FREDERICK C. SCHEUCH, B. M. E., A. C.,
Professor of Modern Languages.

MORTON J. ELROD, A. M.,
Professor of Biology.

ARTHUR L. WESTCOTT, B. M. E.,
Professor of Mechanical Engineering.

FRANCES CORBIN,
Professor of English Literature.

WILLIAM D. HARKINS, A. B.,
Instructor in Chemistry and Physics.

MRS. WALTER WHITAKER,
Instructor in Music.

ELOISE KNOWLES, Ph. B.,
Instructor in Drawing, and Assistant in English.

GRACE HERNDON,
Instructor in Vocal Music and Physical Culture.

LOUISE HATHEWAY, B. A.,
Assistant in Preparatory Department.

MARY A. CRAIG, B. S.,
Librarian.

JOHN F. DAVIES,
Expert Librarian.

PRESIDENT'S REPORT.

University of Montana,
Missoula, Montana, Nov. 30, 1900.

To the Montana State Board of Education, Helena, Montana.

Gentlemen:—In accordance with Section 5 of "An Act to establish, locate, maintain and govern the University of Montana," the following report for the year ending November 30, 1900, is respectfully submitted:

THE GENERAL PROGRESS OF THE UNIVERSITY.

The general progress of the University during the two years ending November 30, 1900, has been marked by two important events. The occupation of the new buildings, and a large increase in the enrollment of students. The buildings have proven entirely satisfactory, being convenient, well lighted and adapted to their several uses. The campus has been still further improved by the planting of additional trees and the extension of driveways and walks. The water supply has proven adequate and the beautiful lawn and trees have not suffered for lack of proper irrigation.

The attendance the present year is much the largest in the history of the Institution. The enrollment from September to December first, is 45 per cent greater than for all of last year in regular work in straight academic lines. The number of students taking special lines of work remains about the same as heretofore.

This phenomenal increase in attendance is due to several causes. The people of Montana are, year by year, taking a greater amount of iterest in their educational institutions. A

number of cities of the state already have their courses of study so arranged that their graduates may enter the different departments of the University without examination. Other cities and towns, that from lack of population and financial means, are not able to maintain an accredited High School have the work they are able to complete, so arranged as to be in line with the requirements for admission to the University.

The County High School is another factor that is of benefit, and to this we must look as the means that will eventually place the opportunity for obtaining this preparation within the reach of every boy and girl in every county in the state, where such facilities are not already provided by the city schools.

The going into effect of the state course of study for common schools is another of the factors that has contributed to the increase in numbers. Where High Schools are not accessible to those completing this course, the students are coming to the University to complete their preparation for collegiate work. This, they do in the Preparatory Department, their diplomas being accepted for admission to this department.

From its first organization the University has striven for a complete unification of our state educational system. A decided advance has already been made in this direction and the more completely the details can be worked out, the better it will be for the whole system. We have all the steps in the system; the Kindergarten, the Common School, the High School and the College and University. The thing especially needed is to bring the work of each in complete harmony with all the others.

Another gratifying thing this year has been a marked increase in the thoroughness of preparation that the new students have made for their work. It has been my custom from the first organization of the University to require reports from all classes, from time to time, of all persons who, for any reason whatever, are behind in their work. No matter what the cause, whether insufficient preparation, negligence, sickness, unavoidable absence or late entrance, if not fully up with the work, the name is reported and the cause of delinquency stated. Such

a report was taken up the second of November. The number of those reported as delinquent by reason of negligence, lack of preparation and unavoidable absence, was the smallest in the history of the institution.

The attendance is becoming more general throughout the state. More counties are represented this year than ever before. Many families are moving to Missoula in order to have the benefit the University. Because this is true, and, that most of those so coming, invariably give Missoula as their Post-Office, rather than their old one, it is made to appear that the attendance is much more local than it really is, and consequently the service of the University to the whole state is frequently underestimated.

THE FACULTY.

Within the present year there has been a number of changes in the Faculty of Instruction.

Miss Eunice Julia Hubbell, Professor of English Literature, resigned her position at the close of the College year. Miss Frances Corbin, Principal of the High School in Butte, was elected by the State Board of Education to fill the vacancy. Miss Corbin took charge of the department in September and is giving most excellent satisfaction.

Professor Fred. D. Smith of the department of Chemistry and Physics tendered his resignation on the third of September, with the request that it take effect immediately. The resignation was accepted and, after consultation with the executive committee of the State Board and also the University Committee, William D. Harkins, A. B., instructor in Chemistry in Leland Stanford, Jr., University, was appointed instructor in Chemistry and Physics for the current collegiate year. Mr. Harkins at once came to the University and took charge of the work, His managemtnt of the department and his instruction have both been very acceptable.

Prof. Earl Douglass, Assistant in the Department of Physics

and Chemistry, resigned his position September 14th in order to accept a fellowship which had been offered him at Princeton University.

The classes taught by Mr. Douglass have been taken care of by the other members of the Faculty.

I respectfully recommend that Physics be separated from the Department of Chemistry and that an instructor in Physics be appointed. Said instructor to begin service not later than the beginning of the second semester of the present year.

In accordance with the order of your honorable board at the meeting of June, 1900, the University Committee met and selected John F. Davies of Butte, as expert Librarian. Mr. Davies began work November 1st and is diligently employed in indexing and classifying the works in the Library. His report accompanies the report of the Librarian and is herewith transmitted.

Miss Grace Herndon, who had charge of the Physical Culture work for girls, resigned her position at the close of the College year in June and Mr. Guy Cleaveland, Gymnasium Instructor gave up his position near the close of the year. So far these positions have not been filled. It is of the utmost importance that someone be added to the Faculty, who will be able to carry on this important work.

There is also need of an instructor who will give training in Elocution and Voice Culture. This was a part of Professor Hubbell's work, but since her resignation we have had no one willing to undertake the work. It is quite possible that an instructor be employed who will be able to take charge of both Physical Culture and Elocution.

DEPARTMENTS AND SCHOOLS.

The following departments and schools have been organized: History and Philosophy, Chemistry and Physics, Biology, Modern Languages, Ancient Languages, English and Literature,

LIBRARY.

Drawing, Mathematics, a School of Mechanical Engineering and a Preparatory School.

Extracts from the reports to the President by the heads of departments accompany this report.

THE PREPARATORY SCHOOL.

The Preparatory School has been doing effective work in the preparation of students for collegiate work. The Statutes provide that whenever the State Board of Education thinks proper, it may be dispensed with.

As far as may be judged from the present outlook, it will be a number of years before its usefulness has been ended.

Some two years ago it was strengthened by the addition of one year to its course, making it three years, the same as in the accredited High School.

So far there has been no formal organization of the preparatory work as distinct from the collegiate. All are under the same regulations and subject to the same control. The work has grown to such proportions that a Principal of the Preparatory School should be appointed, whose duty, aside from giving instruction in certain lines, would be to supervise the work of the Preparatory School and be responsible to the President of the University for its proper management and control.

THE SUMMARY OF ENROLLMENT.

The total enrollment, exclusive of the School of Music, for the several fiscal years since the opening of the University, has been as follows:

For the year ending November 30, 1895	118
" " " " " " , 1896	176
" " " " " " , 1897	200
" " " " " " , 1898	214
" " " " " " , 1899	203
" " " " " " , 1900	243

The enrollment by classes for the year ending November 30, 1900, is as follows:

Psychology	21
Political Economy	11
History of Philosophy	5
English Constitution	12
Ancient History	79
Mediaeval and Modern History	68
Political Science	12
Elementary Chemistry	40
Qualitative Analysis	13
Quantitative Chemistry	11
Organic Chemistry	2
Water Analysis	1
Preparatory Physics	35
College Physics	12
General Dynamic Geology	13
Mineralogy	6
Lithology	2
Metallurgy	3
Second and Third Preparatory Mechanical Drawing	11
Freshman Mechanical Drawing	10
Sophomore Mechanical Drawing	7
Machine Design	4
Steam Engine Design	1
Descriptive Geometry	3
Wood-shop Practice	14
Bench Work in Wood (Recitations)	3
Pattern-making	5
Pattern-making (Lectures)	6
Forging	3
Machine-shop Practice	4
Lectures in Machine-shop practice	4
Kinematics	4
Strength of Materials	1
Electricity and Magnetism	1
Steam Boilers	2

Theory of the Steam Engine	1
Valve Gears	1
Transmission of Power	1
Required Literature	49
Elective Literature	17
Graduate Literature	1
Rhetoric	31
Preparatory Rhetoric and Literature	36
Second Preparatory Rhetoric	68
First Preparatory Composition and Literature	78
Latin	127
Greek	5
Greek Life	11
Roman Life	9
Graduate Latin	1
Elementary Algebra	107
Plane Geometry	37
Solid Geometry	6
Trigonometry	36
Higher Algebra	22
Analytic Geometry	11
Calculus	8
Elective Geometry	10
Free-hand drawing, first year	38
Free-hand Drawing, second year	10
Free hand Drawing, third year	1
Free-hand Drawing, fourth year	3
Preparatory Biology	24
College Biology, first year	22
College Biology, second year	11
College Biology, third year	6
College Biology, fourth year	2
Photography	7
Preparatory Physiology	4
Physical Geography	13
Preparatory German	17
College German, first year	58

College German, second year..... 20
College French, first year 41
College French, second year 21
College French, third year 5

DEGREES CONFERRED.

The first degree granted by the University was in June, 1898, when the degree of Bachelor of Arts was conferred on Mrs. Ella Robb Glenny and the degree of Bachelor of Philosophy on Miss Eloise Knowles.

In June, 1899, degrees were conferred as follows: Zoe Bellew, B. A.; Anna Louise Hatheway, B. A.; Helen McCracken, B. A.; George Hempstead Kennett, B. S., and Charles Pixley, B. A.

In June, 1900, Charles Earle Avery, B. Ph.; Mary Gertrude Buckhouse, B. S.; Carolyn Cronkrite, B. S.; Lu Knowles, B. S.; Eben Hugh Murray, B. A.; Percy Shelley Rennick, B. Ph., and Sidney Ellery Walker, B. S.

Only one graduate degree has been conferred, that of M. S. upon Earl Douglass, a B. S. of Ames College Iowa.

THE LIBRARY.

MARY A. CRAIG, B. S.—LIBRARIAN.
JOHN F. DAVIES, A. B.—EXPERT LIBRARIAN.

The additions to the library for the fiscal year ending November 30th, 1900, consists almost entirely of volumes purchased for the departments and donations from the United States government and from scientific societies.

The number of bound volumes in the library.....6114
The number of unbound volumes in the library..... 320
The number of pamphlets in library.....6000
The number of periodicals on file in the library..... 67

The following newspapers are donated by their respective publishers:

The Chronicle, Bozeman.
The Western News, Hamilton.
The Avant Courier, Bozeman.
The Billings Times.
The Glendive Independent.
The Neihart Herald.
The Silver State.
The Madison County Monitor.
The Big Timber Express.
The Edward's Fruit Grower, Missoula.
The Yellowstone Leader, Big Timber.
The Helena Herald.
The Inter Mountain, Butte.
The Chinook Opinion.
The Sentinel.
The Philipsburg Mail.
The Citizen's Call.
The Western Mining World.
The Inter-Lake.
The Tribune, Butte.
The Weekly Tribune, Dillon.
The Northwest Tribune, Stevensville.
The Rocky Mountain Husbandman.
Mining, Spokane.
The Dillon Examiner.
The Townsend Messenger.
The Jefferson County Sentinel.
The Big Timber Pioneer.
The Forsyth Times.
The Sentinel, Boulder.
The Helena Independent.

The following is a list of the magazines and pediodicals on file for the use of members of the University:

The Forum.
Scribner's Magazine.
Chautauquan.
Forest and Stream.
The Chemical Journal.
The American Chemical Society Journal.
The School Review.
Book Reviews.
The Monist.
Education.
Zeitschrift fur Anorganische Chemie.
Botanical Gazette.
The Classical Review.
The Journal of Association of Engineering Societies.
The Engineering and Mining Journal.
Power.
The Electrical Review.
The Public School Journal.
Public Opinion.
Fliegende Blaetter.
Merck's Report.
The Bookman.
The Literary Digest.
The Artist.
The International Studio.
Popular Science Monthly.
Harper's Weekly.
Harper's Monthly Magazine.
North American Review.
Atlantic Monthly.
The Cosmopolitan.
The American Naturalist.
Science.
Journal of Geology.

The Scientific American and Supplement.
The Railway Age.
Foundry.
Entomological News.
The Analyst.
American Archaeologist.
Bulletin de la Chemique.
Journal of London Chemical Society.
American Journal of Mathematics.
Zum Fels und Meer.
Die Gartenlaube.
Illinois Staats Zeitung.
Ueber Land und Meer.
Psyche.
Nature.
The American Monthly Microscopical Journal.
The Journal of Applied Microscopy.
The American Journal of Science.
Bird Lore.
Zoologischer Anzeiger
Journal of Morphology.
The Photographic Bulletin.
The American Architect.
The Outlook.
The Anaconda Standard.
Current History.
The Educational Review.
School and Home Education.
Engineering News.
Engineer's Magazine.
Cassier's Magazine.
The American Machinist.
The Electrical World.
The Western Electrician.
Mining.
Political Science Quarterly.
Ladies' Home Journal.

American Journal of Psychology.
The Independent.
The Dial.
The Century Magazine.
Review of Reviews.

In reference to the work of arranging and cataloguing the collection in the Library, it may be well to outline some of the purposes of a University library and briefly to indicate how these objects may be assisted by the system now in process of introduction.

The university library is designed:—

1. To encourage on the part of the students, a familiarity with the books in the collection.

2. To enable the students and faculty to use to the best advantage the information contained in books, periodicals and pamphlets, which bear upon the work considered in the classroom.

3. To acquire such a working knowledge of the catalogue, together with the important bibliographies and other aids, as will enable the students in after years to master the resources of any library, or to find out for himself what may have been written in any line of thought in which they may be interested.

To effect above objects every university library should be fully catalogued, and give such practical instruction in library methods and aids as may be necessary.

The most essential appliance in unlocking the hidden resources of the collection, will be the card catalogue. This catalogue will consist of two parts. The first part will consist of a card for every subject of importance, whether treated in bound volume, periodical or pamphlet, unless the treatise on such subject is included in bibliographies of special subjects which may be obtained by the library. These cards will be arranged in numerical order, according to the arrangements of the subjects in the decimal system of classification. By means of this part of the catalogue, one who is familiar with the principles of the system may find the full resources of the library

MUSEUM.

on any given subject with more certainty than one who depends on the alphabetical catalogue.

The other part of the card catalogue will consist of author, title and subject cards arranged in one strict alphabetical order. There will be an author card for each book or article catalogued, a title card for every title that seems to possess individuality, and as many subject cards as may be desirable to give the fullest utility to every article. The value of the card catalogue in making available the resources of the library is evident to one who considers how completely lost are the papers bound in scientific reports, in the various periodicals or in the vast number of pamphlets contained in any library, unless some system exists whereby it may be made known what they are and where they are. The most complete library in the world does not contain enough books to satisfy the enthusiastic student. But, by a proper method of cataloguing and indexing, the limited contents of our collection may be made as useful as ten times their number of volumes when such aid does not exist.

Besides the card catalogue proper, there are other catalogues which contribute to the convenience of using the collection, while they are essential to the business management of the library.

The accessions book contains a full description of every book that the library contains, and has a record of the manner in which any book may have been disposed of. The shelf list is necessary for the arrangement of the books on the shelves, if such an arrangement is to be made and maintained with the smallest expenditure of time and effort. In case it becomes necessary to know the exact number of books on hand, when the books themselves cannot tell the story, as in the case of destruction by fire, the shelf list and the accessions book become very important.

Also records must be kept in the library respecting what books are ordered and when, which of such books may have been received, and why others have not been obtained. The librarian must know whether every periodical subscribed for,

is being received at the regular time and be able to attend to any mistake in the time. Records of the number and disposition of the duplicates and various other records, are also desirable.

Perhaps for the great body of students, the most practical method of learning the use of the library will be to use it to the fullest extent in connection with their regular studies or the investigation of the subjects with which they may desire to become acquainted. In such cases the librarian and expert librarian will always be glad to give such individual explanations as may be desired.

If there are students who desire to take a course in cataloguing, the selection and use of books, and other subjects of library arrangement, a class will be formed at the beginning of the next semester, which will be conducted by the expert librarian.

THE MUSEUM.

The several departments of the University have been active in attempting to build up the collection of the Museum. The collections have now entirely outgrown the quarters allotted. Every inch of space is taken and the storeroom contains dozens of packages unopened. If the present store-room were fitted with shelves and cases, some relief would be afforded, but only temporarily. At the rate material is brought in, there is great need for much more room.

The growth of the museum has been rapid, and there is every reason to believe it will be still more rapid during the coming year. The list of contributions shows that friends have recognized the needs of the University, and are adding liberally to the collections. Most of the material so far, is from the state. There is now opportunity to make purchases and exchange material from other regions, whenever appropriation can be made for such purpose.

Through the generosity of friends of the University, a fund was raised for collecting fossils and placed in the hands of

Earl Douglass, who had charge of the work in Geology. The entire summer was spent in collecting Geological material and fossils, and a large amount secured, most of which, is yet unpacked and unassorted.

This will make a large and valuable addition to the collections but, until more ample quarters are provided, it cannot be exhibited. The additions during the past year are as follows:

C. A. Stillinger, Superior, 125 arrow tips from Snake River; one pipe from Spokane Indians.

J. M. Keith, city, millstone from the first mill in western Montana; large piece of fossil wood.

Chas. J. Savage, Red Lodge, arrow tip; several old coins.

J. W. Dougherty, Corvallis, a potato of large size and curious growth.

A. L. Stone, city, complete make-up of a page of the Anaconda Standard, showing all stages from original drawing to printed page.

Mrs. Fred D. Smith, city, cotton ball from Greenville, S. C.

Rev. C. H. Linley, city, six bills of confederate money.

M. J. Elrod, University, coal from Youghiogheny mine, Pennsylvania.

New York Botanical Gardens, 203 species of plants from Montana.

Mrs. J. H. Kennedy, city, miniature cotton bale from New Orleans Exposition.

Chas. F. Hedges, Miles City, a dozen skins of the redpoll linnet (Acanthis linaria).

Montana and Denver Reduction Company, Bearmouth, set of products of initial run of the mill.

A. B. Browne, Bearmouth, sample of fluorite from Quigley; tedradymite from Garnet.

Mrs. John McCormick, Bonner, fossils and agates from Wyoming; shells from Victoria, B. C.; geodes and sinter from Yellowstone Park.

Lou Lyons, city, piece of the Plymouth Rock; piece of pipe of first water works in the United States; gold ore from Quigley.

Charles Smith, Bonita, copper ores from Copper Cliff country.

Great Falls Fire Brick Co., Great Falls, samples of brick and building stone.

Beaudette Bros., Anaconda, sample of Montana marble.

T. Kain & Sons, Helena, sample of granite.

Billings Sandstone Quarry, Billings, sample of building stone.

Kalispell Townsite Co., Kalispell, Libby Ores.

Fred Buck, Stevensville, burrows of worms.

D. H. Ross, city, mounted deer head.

R. J. Kitching, city, Souvenir medal, Paris Exposition, 1883. Souvenir King's Jubilee, Sweden.

California Powder Co., San Francisco, California, samples of all powders manufactured by them, as also of powders no longer made. Samples of cans, fac-similes of their dynamite sticks. All in a handsome hardwood case with glass all round and plate glass shelves.

Mrs. Henry Myers, city, sample of woven glass.

D. R. Beck, city, young apple trees killed by grasshoppers at Nine Mile. Fossil wood from the Bitter Root, samples of jasper rock from near Virginia City.

Ina and Rose Fullerton, Red Lodge, three horned toads.

Charles Emsley, city, a collection of about 250 mounted insects from Missoula.

Louisa McDermott, two boxes of work representing the work of the Indian children in the Flathead reservation.

Dr. W. . Parsons, city, fungus from pine tree.

P. M. Silloway, Lewiston, a collection of 44 sets of bird eggs, mostly with nests, from various parts of the United Sates.

Missoula Fire Department, fragments from the explosion in Butte in 1895.

W. W. White, Missoula, several rattles from rattlesnakes.

Mr. and Mrs. Morris Ackerly, city, vase turned out of pumice stone from Mt. Shasta.

Major A. L. Duncan, city, 53 species of shells from the Philippine Islands.

Charles W. Johnson, city, a mounted peacock.

Charles F. Hedges, Miles City, through the Biological Station, 268 bird skins.

Paul Reinhard, city, a western grebe.

Gilbert Mills, city, several skins of ducks.

Frank Ives, New York Morning Post, November 7, 1783.

Loaned by Harold Blake, implements of war from the Philippines and officer's sword, a bolo and a Ba'iong.

Loaned by Major A. L. Duncan, implements of war from the Philippines, 2 halberds, 3 spears, 2 bows and 5 arrows, 1 flag, 5 swords.

Dr. J. W. Blankenship, Agricultural College, 263 species of Montana plants from the Williams collection.

Biological Station, nearly 500 bird skins; a series of shells, both land and fresh water; 114 vials of entomostraca from the lakes and rivers of the state; several hundred species of plants; a series of insects, not yet mounted; about 250 fish from the lakes and rivers; about 20 mammal skins; about twenty pieces of wood of the state.

THE JOHN M. EVAN'S HALL.

The flourishing condition of the University Literary Societies is partly due to the elegant furnishing of the Literary Society Hall.

This was done through the liberality of Hon. J. M. Evans and other citizens of Missoula.

The furnished hall was formally dedicated March 18th with impressive ceremonies, at which addresses were made by Mr. Evans and Hon. S. G. Murray.

Mr. Evans having taken the initiatory in the effort to furnish the room, it was considered proper to name the hall after the principal donor, and so, in grateful remembrance, it was christened the John M. Evan's Hall.

THE H. N. BUCKLEY ORATORICAL CONTEST.

Through the generosity of Dr. J. J. Buckley of Missoula, this prize was founded in memory of his father, H. N. Buckley.

The amount of the prize is twenty dollars and this amount is derived from a permanent investment made to secure its endowment. The conditions of the oratorical contest at which the prize is bestowed, are subject to the control of the faculty.

This prize was awarded in 1896 to Miss Anna Gray; in 1897 to Charles Pixley; in 1898 to Louise Hatheway; in 1899 to Guy H. Sheridan and in 1900 to Eben Hugh Murray.

THE STATE ORATORICAL CONTEST.

An important movement to promote the cultivation of Oratory has been successfully inaugurated during the current year. The Institutions represented are the Montana Wesleyan University at Helena, the Montana College of Agriculture and Mechanic Arts at Bozeman and the University of Montana at Missoula.

At each institution an Oratorical Association is formed, which directs the local preparations for the state contest. These local associations are combined in a state association, which manages the state contest.

The President of the local association of the institution at which the state contest occurs in any year, is also President of the State Association for that year.

The University selects its representation by a preliminary contest which is conducted under the same rules as the state contest.

In the first state contest held at the University, May 4th, 1900, the first honor was awarded to Lawrence L. Hechler, the University representative. The next contest will be held at Bozeman. Great interest has been aroused by these contests and much good already accomplished.

THE COBBAN PRIZES.

A citizen of Missoula, Mr. R. M. Cobban, has offered for this year four prizes for the encouragement of scientific research.

These are a first and second prize for papers in Geology and a first and second prize for papers in Physical Geography.

Competition in the Geological papers is open to collegiate students and the Physical Geography papers to Preparatory students. The amount of the first prize is fifteen dollars and the second, five dollars.

The papers are to be based upon the study of some material brought by Mr. Cobban from Santa Barbara, California.

Rules governing the preparation of the papers and the judging their merits have been adopted by the Faculty and approved by Mr. Cobban.

ATHLETICS.

Athletics has received a decided onward impulse during the current year. This has been made possible and is largely due to the financial assistance of the Athletic fee fund.

From this fund there has been made the following provisions for Athletics: Baseball and football equipments, hammers and shots, vaulting pole and standards, hurdles for hurdle races, three good tennis courts and three croquet grounds with equipments, improvements on the football and baseball fields and a skating pond.

Through the aid of these equipments, the first creditable field day exercises were held in June, 1900, consisting of contests in running, jumping, hammer and shot throwing, hurdle racing, pole vaulting, tennis and baseball.

Reasonable attention to Athletics is believed to be conducive to the interests of the students and the University, and is therefore encouraged.

THE SUMMER SCHOOL.

At the June meeting of the current year authority was given to establish a summer school at the University. From present indications it will have a large attendance. Full details of the or-

ganization of the school, length of term and courses of instruction to be offered will be filed at the June meeting.

The summer school affords opportunity to many to do work which they can do at no other time of year. Whenever established they have been a helpful factor in advancing the interests of the institutions with which they have been connected.

THE SCHOOL OF PEDAGOGY.

In December 1898 it was ordered that a school of Pedagogy be established at the University. This was done and was maintained for one year, a very satisfactory number of students took the work. On account of lack of funds this department was ordered discontinued in June, 1899.

There is a strong demand for this department and steps should be taken to reinstate the department at the beginning of the next college year.

THE SCHOOL OF PHARMACY.

There is a positive demand for the establishment of a school of Pharmacy at the University. With the laboratory space already at command and the instructional force necessary to carry on the work of the department of Chemistry, the additional expense for beginning the work of Pharmacy will be slight, and will be amply compensated by the good done for those young people of Montana who desire such work and at present are compelled to go out of the state to get it. The course should be so arranged that those who complete it, after passing examination would receive the diploma of the State Board of Examiners in Pharmacy.

NEW BUILDINGS.

The General Assembly of 1897 gave the University authority to issue bonds to the amount of one hundred thousand dollars. The

interest on these bonds is met by the income of the University fund. The interest on the present issue of bonds has not only been promptly met, but there is a surplus constantly accumulating that is sufficient to justify another issue in like amount. It is confidently believed that such bonds would find purchasers at a rate not exceeding 4 per cent per annum.

The buildings most needed and that seem indispensable to the continued development of the University are, a Woman's Hall, a Library and Museum Building, and a Gymnasium. Through the courtesy of Mr. A. J. Gibson, the Architect of the present University buildings, I am enabled to submit plans and elevations that will give a good idea of the proposed improvements. I transmit also sketch of the University campus as it will appear after the proposed improvements are made.

THE WOMAN'S HALL.

Perhaps the most pressing need of the University is a Woman's Hall that will provide living accommodations on the college grounds for women students. Such accommodations would greatly increase the number of students. There are many parents, who prefer, when sending their daughters away from home to be educated, to place them where they can be continually under control of the institution where they may be taking their work.

Such provision for students' homes also provides a unifying center of interest and helps to develop a more vigorous University spirit. It furnishes a center about which clusters the social life of the University.

THE MUSEUM AND LIBRARY BUILDING.

In addition to the Woman's Hall previously mentioned there is also great need for a building to be devoted to Museum and Library purposes. The work and demands of the Institution have already outgrown the quarters prepared for both of these interests. Although the plan of Department Libraries which has

been adopted relieves the pressure to some extent, still the present room is so crowded that relief must be sought in some quarter.

The museums are already full to overflowing and hundreds of pounds of material not unpacked on account of lack of room to display and arrange it. An orderly arrangement of Museum material is one of the demands of the modern scientific education. In order to make this orderly arrangement, more space is needed. After the transfer of the Library and Museum to new quarters, the rooms now occupied can be utilized for lecture halls which are already needed.

THE GYMNASIUM.

The northeast corner of the University ground has been laid off as an atheletic field. Provision has been made for baseball and football grounds and also for tennis and croquet. A bicycle track a quarter of a mile in length has been partially completed.

Convenient to these a neat and inexpensive gymnasium should be built.

Up to the present time a room on the third floor of University Hall has been used for gymnasium purposes. Through the kindness of Mr. H. B. McLeod, of Missoula, it has received a good equipment. The room however is not well adapted to its purpose and should be devoted to other uses and a suitable structure erected on the site proposed.

A STATED TAX.

In order to secure permanency, prevent difficulty and to secure the best results a permanent appropriation should be made to the University from the funds of the state. This appropriation might take either of two forms, a stipulated amount per year or a permanent appropriation of a fraction of a mill on the assessed valuation of the state.

Unless it can be known in advance the amount of money that can be available for University maintenance, no fixed and perma-

nent policy of development can be maintained. There is just as much reason for fixed salaries of Professors in the State University as there is for fixed salaries for state officers.

It will constantly be found difficult to secure the best men for positions in the University Faculty unless there are prospects for permanency. This can only be true when the Institution may know what its income will be for years in advance.

Of the two forms of appropriation above mentioned, the levying of a certain number of mills or fractions of a mill is to be preferred. This plan is in use in many states and has proven very satisfactory.

The needs of the University increase in about the same ratio as the increase in the taxable property of the state.

It is possible to make a levy in this manner sufficient for all the institutions of the state in the University system and then appropriate pro rata to each.

FINANCIAL STATEMENT.

RECEIPTS.

Balance on hand from Library Fund	$ 636.43
Received from Matriculation Fees	1,583.85
From Legislative Appropriation	21,590.00
	$23,810.28

EXPENDITURES.

Salaries of Faculty	$13,488.23	
Salaries of Employees and Assistants	2,192.50	
Laboratory Equipment	534.11	
Laboratory Supplies	930.85	
Library	667.43	
Expressage, Freights and Drayage	146.83	
General Supplies	207.38	
Printing and Advertising	496.44	
Water, Heat and Light	1,588.94	
Student Labor	195.95	
Improvements in Buildings	480.28	
Improvements on Campus	1,457.16	
Office Supplies(Postage, Stationery, etc.)	226.07	
Traveling Expenses	248.62	
Overdraft from 1899	949.49	
		$23,810.28

ATHLETIC FUND.

RECEIPTS.

From Athletic Fees $237.00

EXPENDITURES.

For Athletic Supplies and improvements in Athletic Park 237.00

All of which is respectfully submitted,

OSCAR J. CRAIG,
President.

APPENDIX.

Extracts from Department Reports

HISTORY AND PHILOSOPHY.

OSCAR J. CRAIG, A. M. PH. D. PROFESSOR.

The Statute organizing the University provides that the President shall have charge of a department of the University, until in the judgment of the State Board of Education, he should be relieved of the same. The department of History and Philosophy is still cared for by the President of the University. All the classes in Philosophy and the advanced classes in History are taught by the President.

Relief from the class-room would give the opportunity of doing much valuable work for the University, that, under the present circumstances, must remain undone. It is respectfully recommended that the President be relieved from all class work at the close of the present college year.

The number in the various classes in this department for the year ending November 30, 1900, has been as follows:

Psychology	21
Political Economy	11
History of Philosophy	5
English Constitution	12
Ancient History	79
Mediaeval and Modern History	68
Political Science	12

Miss Eloise Knowles has rendered valuable service as assistant in this department.

ENGLISH AND LITERATURE.

FRANCES A. CORBIN, PROFESSOR.

No attempt will be made to give a detailed account of what the work in English embraces; but a few remarks may be given as to scope, purpose of the work, the methods employed in the work and its present condition.

This department includes the work in Literature and Rhetoric.

Course I. In Literature occupies four hours a week, one-half of the year. This work has two objects in view: (1) To give the student a knowledge of the History of English Literature, so that he may be able to take more advanced work and do general reading intelligently. (2) To make the student intimately acquainted with a part of the works of the greatest English writers, by forming the habit of reading them critically. This end is sought to be attained by class room discussion of the Pre-Shakesperian Drama, attention being paid to close interpretation of the text, development of plot, analysis of characters and general aesthetic criticism.

Course III. The work in this course is based on the Lake School poets and their contemporaries. This is a purely literary course and treated by the method of aesthetics requires from every student a large amount of reading.

Course V. Is advanced work in American literature. The general purpose of this course, as in the other courses, is to foster the love of literature, and the development of the critical sense in such a manner as to strengthen the emotional and aesthetic faculties.

The work in rhetoric is largely technical and mechanical. Constant practice in writing is required, the object of which, is the practical one of endeavoring to give training in the use of English.

The Library is necessary to the English department, and with the reference books we now have, personal research and laboratory work is carried on with interest.

The number enrolled in classes in this Department for the year ending November 30, 1900, is as follows:

Required Literature	49
Elective Literature	17
Graduate Literature	2
Rhetoric	31
Third Preparatory Rhetoric and Literature	36
Second Preparatory Rhetoric	68
First Preparatory Composition and Literature	78

In looking over the year's work, progress is noted and a substantial condition now exists.

DEPARTMENT OF LATIN AND GREEK.

WILLIAM M. ABER, PROFESSOR.

It is believed that the most important aim of education, except that of technical and professional schools, is the development and cultivation of innate capacities, and that the subject matter of this department furnishes unsurpassed material for the accomplishment of this aim. The power of grasping abstract conceptions of logical relations, of making subtle discriminations of thought and feeling is fully exercised in the study of Latin and Greek; since these languages have the most complete logical and systematic grammatical development.

The aim considered next and scarcely secondary in importance, is cultivation of power of expression.

The careful study and translation of any foreign language is one of the most efficient means of enlarging our knowledge of words and how to use them; and for this purpose, the enrichment of the English vocabulary from Latin and Greek and the greater unlikeness of these languages in sentence structure and word order, probably make them more efficient for this purpose than any modern ones.

A third element of this department is the cultivation of artistic taste and rational views on social and political institutions and customs. For these purposes courses in the life of the Greeks and Romans are given. This includes study of their useful and fine arts, of their amusements, religion, education, industries, social customs, and like topics. From this study some valuable suggestions applicable to our modern life, may be derived.

In the pursuit of these aims a fair measure of success has been attained during the past year. Students in this department have, with few exceptions, done faithful and efficient work.

Greek is not required in any course. Latin is required in but one of our four general collegiate courses, the Classical. Notwithstanding this freedom of election, about two-thirds of our preparatory students take Latin, and the division of the Collegiate students between the four Collegiate courses has been about equal.

The numbers enrolled during the year in the department are as follows:

Latin	127
Greek	5
Greek Life	11
Roman Life	9
Graduate Latin	1

In the year 1898-99 the enrollment was:

Latin	105
Greek	4
Greek Life	11
Roman Life	4
Graduate Latin	1

MODERN LANGUAGES.

FREDERIC C. SCHEUCH, PROFESSOR.

The aim in the first two years in Modern Lauguages is to prepare the students for independent work. In the Engineering course students are given one year of German, the aim being to enable them to read ordinary scientific works. Monographs or German texts are used in the course.

In the second year classes in both languages, the object is more for the purpose of literary culture. Three hours a week are given to reading advanced French and German, one hour to review of German, one hour to review of Grammar and Syntax, and conversations on the test.

Conversational work is given throughout the course of three years, this being a change from last year, when, conversation was begun in the second year.

The work given in the Preparatory has been in the beginning German. Students upon the completion of this work may enter Collegiate German.

Essays on general topics have been required from time to time, and scientific monographs have been translated from both French and German.

Some easy reading material should be added to the library for the use of beginners.

The work has been in advance of that done in past years; the readings have been of a more difficult character and the amount accomplished greater.

The enrollment for the year ending Nov. 30, 1900, was as follows:

German. first year	58
German, second year	20
French, first year	41
French, second year	21
French, third year	5

DEPARTMENT OF MATHEMATICS.

CYNTHIA ELIZABETH REILEY, PROFESSOR.

The aim of the instruction in this department is to develop the habit of exact, continued and independent reasoning; to cultivate the imagination; to train the student to apply theory to practical problems; to secure accuracy and rapidity in numerical computations; to develop the habit of concise, logical statement of argument and conclusion; and to furnish the facts necessary

for the student in the pursuit of studies having a mathematical basis. In the furtherance of this aim methods vary as circumstances suggest. Much original work is required, and in all elementary work the necessity of taking one step at a time is emphasized.

The work of the department shows continued improvement. One gratifying feature is the increase in the number of students doing elective work. Students have elected Analytic Geometry and Calculus and the number taking Elective Geometry is larger than ever before. The small enrollment in Solid Geometry is due to the change to the new preparatory course of study.

The number enrolled in the various classes for the year ending November 30, 1900, is as follows:

Elementary Algebra	107
Plane Geometry	37
Solid Geometry	6
Trigonometry	36
Higher Algebra	22
Analytic Geometry	11
Calculus	8
Elective Geometry	10

DEPARTMENT OF FREE HAND DRAWING.

ELOISE KNOWLES, INSTRUCTOR.

The work in this department is divided into courses, which cover three years. The first year, which is required of all students, consists of pencil, ink and charcoal drawing from geometric solids, objects, room interiors and casts. The course is so graded as to give the student an increasing facility in conception and execution.

The second and third year courses are elective. In these a choice of three lines of work is given: black and white work, water-color and oil. In the second year the work consists of drawing in charcoal from the cast, of drawing and painting from still life and of quick sketching from life. It is accompanied by

lectures on the history of Ancient Art. In the third year the work is more advanced than in the second and is accompanied by lectures on Mediaeval and Modern Art.

The number of students enrolled in this department the last year is as follows:

First year	36
Second year	10
Third year	1
Special Students	3

BIOLOGY.

MORTON J. ELROD, PROFESSOR.

The growth of the department has been constant and the work accomplished by the students is constantly reaching a higher plane. The proportion of the College students taking the advanced work has increased, which is a good indication. This increase in the number of advanced students demands increased material and appliances for work. The department is very anxious to give advanced students such work as they desire, as it is the advanced students who will give the department and the University the recognition it needs.

The introduction of a partial course in Photography has proven that it was desired, a class of seven being enrolled, taxing the facilities. A complete equipment for this work is very desirable, as photography is one of the most valuable aids in scientific work.

At an early date a course in Bacteriology should be offered. Provision should be made for more ample library facilities both in periodicals and bound volumes.

Space in the rooms of the department is at a premium, and more ample quarters will soon be needed.

The department is heavily taxed with classes, and as a consequence less time can be put on the museum and work of the collections than should be to keep up with the material sent in.

About 1500 microscopical slides, the work of the students, are ready for distribution to high schools. These have been in part sent out to high schools on the accredited list.

A few butterflies have been sent to the collection of the State Historical Society. Others are ready as soon as they can be sorted and arranged.

The Professor of the department is chairman of the State Board of Game and Fish Commission and Chief of the Montana Division of the League of American Sportsmen. Through these two channels several thousand communications have been sent out during the past year in the interests of fish and game, both to the individuals and the press of the state. As a result the people are led to feel that the University is taking an active part in a movement of great importance and greatly needed.

The observations of the Weather Bureau are still being made daily.

LIST OF STUDENTS IN BIOLOGY.

Preparatory Biology	24
Preparatory Physiology	4
Collegiate Biology—first year	22
Collegiate Biology—Second year	11
Collegiate Biology—Third year	6
Collegiate Biology—Fourth year	2
Collegiate Biology—Photography	7

DEPARTMENT OF CHEMISTRY AND PHYSICS.

WILLIAM D. HARKINS, A. B., INSTRUCTOR.

The work in Chemistry and Physics is, at present, given by one instructor. Owing to his late appointment and the large number of courses allotted to him it has been difficult to keep the apparatus supply large enough to meet the wants of the large laboratory classes enrolled. It is the wish of the instructor to use syllabi written specially to suit the apparatus of our laboratory, to direct the laboratory work in Physics. It has been found necessary, however, to use printed laboratory guides for the elementary physics, for the present; advanced physics will be directed by syllabi issued by the instructor. The disadvantage of using printed guides in the physics laboratory, is that such

guides frequently describe experiments in a way ill-suited to the use of our apparatus.

Although the number of students taking elementary Chemistry has increased but little since the last report, there has been a remarkable growth in the number of more advanced students. in place of sixteen in Analytical and Organic Chemistry, as reported last year, this report shows twenty-seven students taking these branches. One of these students is just beginning the determination of the boiler scale constituents in the Missoula City Water, and expects to make a sanitary analysis of the same water later. Both of these analyses will be of value to the University and to the people of Missoula.

It is the intention of the department to give more quantitative work in Elementary Chemistry than has heretofore been the custom. In introducing work of this character in the elementary course the department is following closely in the path of the larger Universities of the country.

The work of the department could be done more conveniently and more rapidly without any greater final expense could the general stock of apparatus be increased considerably. In fact, some saving might be effective by purchasing large orders abroad. The laboratories themselves are in excellent condition.

The Department is giving a new lecture course in the metallurgy of iron, steel, copper, the value of the fuels, etc.

Although only thirty-five students are reported in Preparatory Physics there has been a large increase in the size of the class over last year. During last semester the enrollment was nine, only five of whom were taking the laboratory work in this course.

The most remarkable growth of the department has been made in the work in advanced Physics. Last year no students were registered in College Physics. During this semester alone, eleven students have enrolled in the first course in College Physics and one other student has registered for advanced laboratory work. To properly care for the work of these advanced students a considerable increase in the amount of apparatus would seem ad-

visable, when the funds of the University warrant such a purchase.

Twenty-three students have been enrolled in Geology courses since the last report and three in Metallurgy.

In giving the work of the Department, it is the purpose to use as much as possible, the inductive method of study. The student is first set to work in the laboratory to observe phenomena, without first being prejudiced by being told what will occur. It has been found that most students will see in an experiment what they have been told will happen, even if the student has done the experiment under such circumstances that the expected phenomenon cannot possibly occur. The habit of falsely interpreting results is one easy to form and difficult to break. Many of the prominent scientists of the day have formed such a habit in their early work, and are even yet impeded by it. It is desired that the student shall learn to know nature at first hand and to interpret phenomena as accurately as is possible.

The number of courses given by the Department is large for one instructor, especially as a large number of the courses include considerable laboratory work, necessitating the fitting up and making of a large amount of apparatus and a great deal of personal supervision and advice for the students, themselves. In the work in chemistry, the Assistant, Mr. Guy Sheridan, has been very faithful in giving out and looking after the apparatus.

The instructor in charge, has devoted his whole time to the work of this Department. There has been such a large amount of work, that he feels that perhaps more efficient work would have been done, had more help been given.

The following is the enrollment in classes for the year ending November 30, 1900:

Elementary Chemistry	40
Quantitative Analysis	13
Quantitative Chemistry	11
Organic Chemistry	2
Water Alalysis	1
Preparatory Physics	35

College Physics 12
General Dynamic Geology 13
Mineralogy 6
Lithology 2
Metallurgy 3

DEPARTMENT OF MECHANICAL ENGINEERING.

ARTHUR L. WESCOTT, PROFESSOR.

During the past year the department of Mechanical Engineering has made a substantial growth. At the beginning of the University years of '99-00 the wood shop was the only shop having a complete equipment and ready for use. An order was at that time placed for anvils, hammers and other tools necessary for the forge shop, and in the meantime the sophomores who should have been taking forging, were put into the wood working class.

The forge shop was not ready for use until January 1st, 1900. The course of work in forging is supposed to last one semester, and to be followed by one semester of machine shop practice. Owing to the late start, however, the course in forging was not completed until late in the second semester, so that only five weeks were left for work in the machine-shop. Still, considerable good work was done in chipping and filing, and a small amount of work on the shaper.

A number of machines are needed to complete the machine shop equipment. First in importance, is a lathe.

Planing, milling and grinding machines are also needed, as well as a number of small tools.

There has been set apart a room for a foundry, but no equipment has yet been provided. This foundry equipment could be put in at moderate expense and would form a valuable and very desirable addition to the Engineering laboratories.

It is expected that the boilers of the heating and power plant and the 50-horse power engine may be made available for laboratory work in steam engineering. This, however, cannot be done without the purchase of some apparatus,—such as a pair of indicators, steam-gauges, thermometers, weighing scales, etc.

BIOLOGICAL STATION VIEWS.

It is exceedingly desirable that the engineering students have the opportunity to get this work.

Mr. A. Grant McGregor, of the junior class is very acceptably filling the position of student assistant in mechanical engineering this year and has relieved the head of the department of some of the work in elementary mechanical drawing.

The following is the enrollment of students for semesters beginning Feb. 2nd and September 12, 1900.

Second and Third Preparatory Mechanical Drawing	11
Freshmen Mechanical Drawing	10
Sophomore Mechanical Drawing	7
Machine Design	4
Steam Engine Design	1
Descriptive Geometry	3
Wood Shop Practice	14
Bench work in Wood (Recitations)	3
Pattern Making	5
Pattern Making Lectures	6
Forging	3
Machine Shop Practice	4
Lectures in Machine Shop Practice	4
Kinematics	4
Strength of Materials	1
Electrical Engineering	1
Steam Boilers	2
Theory of Steam Engine	1
Valve Gears	1
Transmission of Power	1
Total enrollment of students for the year	32
Number enrolled during present semester	21

SCHOOL OF MUSIC.

MRS. BLANCHE WHITAKER, DIRECTOR,

The Department of Music of the University of Montana provides instruction in vocal and instrumental music and opportunities for the study of chorus work.

One of the principal features is the Pianoforte School, which is in a satisfactory and encouraging condition, both as regards number of students and their proficiency. The School is divided into Upper and Lower, and these again into Senior and Junior. The Juniors of the Lower School use as studies, the New England Conservatory Method, Bertini's, Czerny's or Heller's Easier Exercises, little pieces by Bach, Reinecke, Gurlitt and others.

The Seniors continue the above with scales in similar and contrary motion, and major appreggios of the common chord. More advanced pieces are given.

In the Upper School the work of the Junior grade comprises scales in thirds, sixths and tenths, similar and contrary motion, major and minor common chord appregios, Cramer's Etudes, Czerny's Viruosen Schule and Clementi's Gradus and Parnassus. The Senior Grand in addition to the above takes Arpeggois of the Dominant and Diminished sevenths and studies by Chopin, Henself, Moscheles and others.

There will be classes formed for sight reading, elementary harmony, musical form, and literature.

The standard set is both high and conscientious, and the students are already showing in a very gratifying manner, the result of the training received.

Public recitals are given at least three times during the University year, and are of great benefit to the students, both in encouraging exactness and overcoming nervousness.

The piano used in the Assembly room of the University is the gift of the manufacturer, Mr. George P. Bent of Chicago, Ill.

When possible, artists of distinction will be brought to the

University to give a stimulus and example to the students. During the past year Mr. Godowsky, Mr. Max Benedix, Miss Jeanne Scott and Miss Jennie Osborne, have been introduced to Missoula by the management.

VOCAL DEPARTMENT.

MISS GRACE HERNDON, INSTRUCTOR.

Coice placing and development of the method of M. Sabrilia.

The studies used are Concone's Fifty Lessons and Twenty Vocalises by Marchesi. The latter are sung in Italian, in which language instruction is given.

Songs are studied as soon as it is thought advisable, and the frequent musicales afford opportunity for public appearance.

THE UNIVERSITY GEOLOGICAL EXPEDITION.

EARL DOUGLASS, M. S.

The principal object of the expedition was to obtain Montana fossils for study and display in the Museum of the University. Although this was the main object, good ores, minerals, rock samples and biological specimens were procured, when easily accessible. The expedition was in charge of Earl Douglass, Assistant in the Department of Chemistry and Physics, assisted by Eben H. Murray, a graduate of the University.

The whole distance traveled with horses and cart or wagon, was about 800 miles. This does not include side trips and horseback rides.

Wishing to examine the upper Blackfoot country, which so far as he knew, had not been examined by a Geologist; also wishing to ascertain whether the Neocene lake beds extended across the main divide of the Rocky Mountains, Mr. Douglass started from Missoula alone, to be joined by Mr. Murray at Laurin.

From Missoula to near Sunset the rock is nearly the same old quartzytes and slates as occur near Missoula. In the region

near Sunset there is probably a small amount of lake bed deposit, but it was not carefully examined. Not far from here glacial boulders appear and the spacious valley in which Ovando is situated, is a region of strangely shaped grassy hills, ponds, groves and lakes so characteristic of glacial formation.

Near the road from Ovando to Helmville, the Big Blackfoot River cuts through gray beds of the White River formation sometimes forming quite high cliffs. There are layers of hard sandstone, containing plant impressions. Farther to the southeast in Nevada creek the soft beds of this formation have weathered away, leaving thousands of flint fragments exposed. Many of these contain fresh water snails also turned to flint. A good many of these peculiar fossils were secured. Still nearer to Helmville a few teeth and bone fragments were obtained; enough to show that the deposit is of the White River age. So far as seen the outlying and underlying rock was still the old quartzytes.

South of Avon on the road to Deer Lodge, is a large area of basaltic lava. In places the vapor in the heated rock had condensed leaving the cavities so often seen in surface flaws. Afterward water holding minerals in solution often percolates through the rock and the deposit of the minerals gradually fill up these cavaties, forming what are called amygdules. In this rock the amygdules are, many of them, finely beveled agates. Many of these have weathered out of the decayed lava but some specimens of the basalt were obtained which contain the agates as found.

South of Silver Bow the Neocene Lake beds were found to be continuous across the Main Divide of the Rocky Mountains and previous to this an old river valley had extended across so the rivers in this region have evidently changed their courses and the main divide was not in the same place as at present.

In the vicinity of Melrose the Palaeozoic rocks are well exposed and in the mountains to the east. Devonian fossils were collected here. The hills to the west are cretaceous, probably, principally of the Dakota group. The Neocene lake beds also occur here and contain fossil wood. Near Divide on the Bighole, part of the skeleton of a three-toed horse was obtained.

A collection of carboniferous fossils was made in the Ruby Mountains and a series of rock sections, beginning in the Archaean gneiss and extending through the crystalline limestone and gneiss of the Cherry creek formation up into the Cambrian limestones where Trilobite remains were obtained.

A trip was made up the Ruby River to the Sweetwater. The lake beds were examined but no good vertebrate fossils were obtained. A camp was made by some high hills just above the Raymond branch on the Sweetwater. The rock here is peculiar. Some of the rocks are banded with different colors and are very beautiful. Samples have been picked up by the curiosity seekers and have been quite widely scattered. Some specimens have found their way to the University. The rock has been called jasper and the hills are popularly known as "Jasper Mountain." As the rock is not jasper and the hills or mountains evidently are an old volcano or two volcanoes, Mr. Douglass, in the labels and notes of the collection to correct a popular error, has called it Raymond's volcano. The samples already at the University give no idea of the variety in the appearance of the rocks in this place and a set of something like 125 rock samples were obtained showing the great variety and furnishing material for the study of the interesting problem of their origin. They are numbered in the order of their superposition.

The outfit then returned, crossing the divide east of Virginia City and camped on Wigwam Creek. In the canon of the Wigwam some sub-carboniferous fossils were obtained, including some small, but possibly new Crinoids.

From here the most difficult trip was made. As much of the load as could be spared was left on the Wigwam, to make the wagon as light as possible. The Tobacco Root Range was ascended and the crest of the range was traversed with horses and wagon for a distance of 25 miles. In the vicinity of Black Butte, the skeleton of a large Dinosaur had been found by Mr. Bert Kellog and Mr. Wm. Thompson. I was hoped that other remains might be found. The strata in which it occurred was found to be the Jurassic, which is well exposed in this region. It was not found to be rich in fossils and so far as Dinosaurs were con-

cerned, the trip was not very successful. A large collection of carboniferous fossils was obtained, however, from a horizon different from the other horizons from which carboniferous fossils had been obtained. These will furnish a valuable addition to the Museum and an interesting study. The fossils were obtained in what are called the "Red Beds" near the top of the Carboniferous. The flies and mosquitos were something terrible here, making an extended stay almost impractible. Mr. Murray, however, made good use of the available time and collected many of the insects that inhabit this high altitude 8,000 to 10,000 feet above the sea-level.

The next large and valuable accession of material was made near Three Forks where a splendid collection of Devonian fossils containing, without doubt, several new species, was obtained.

The expedition then went eastward, passing through Bozeman and Livingston to Big Timber. At the latter place it turned northward, camping on Mr. Robert McClatchey's ranch. Here the camp remained until Mr. Douglass started for the east. The rocks here are principally cretaceous of the Javamic division and are rich in fossils both vertebrate and invertebrate of large size. Many beautifully preserved fossil leaves were also found. The most attractive museum specimens were obtained here and all within a radius of 15 or 20 miles. Before Mr. Murray left for Miles City toward the last of August, he collected many biological specimens from the various regions visited. His collection of butterflies and dragon flies will probably prove especially attractive.

THE BIOLOGICAL STATION.

MORTON J. ELROD, B. A., DIRECTOR

The work of the Biological Station for the second season proved eminently successful and was productive of much enthusiasm and interest on the part of those attending. The material, as the result of the work, is large, and is described in the report appended. The weather was perfect and conditions were favorable for successful work.

In addition to the work of the director, which occupied the

entire summer in getting things in shape for work, before starting on the collecting trip, and in caring for the material on the return, Prof. L. A. Youtz, of Montana Wesleyan University and Prin. P. M. Silloway, of Fergus Co. High School, each spent most of the summer in the work of the Station, as also Mr. Chas. F. Hedges of Miles City, in part.

Prin. Silloway went to the Station early in June, and during the month collected bird nests and eggs, finding nests of many species, as given in his report. In July he joined the collecting party in the Mission Mountains and in August aided in the work at the Station. He, therefore spent his entire summer in the work. He is deserving of high commendation and grateful recognition for his services, especially since his traveling expenses were paid from private funds.

Prof. Youtz reported for work early in June, spending two weeks in the study of the microscopical life secured the previous year, after which, he joined the collecting party. His services were given for eight weeks, the entire time being given to the study of the microscopical life of the fresh water lakes and rivers. The results are given in a separate paper, prepared conjointly by Prof. Youtz and the Director, which is recommended for publication at an early date. Prof. Youtz also paid his traveling expenses and is deserving of recognition for his interest and service.

Supt. J. M. Hamilton of Missoula, spent two weeks in taking photographs at the suggestion of the Director, with excellent results.

The collecting trip in the Mission Mountains began July 6th and continued until August 4th. Four camps were made and two peaks ascended. Mary and McDonald lakes were carefully studied, a week being spent at each. At these lakes collections were made in fish, shells, birds, plants and microscopical fresh water life. Most of the material awaits further study. One camp was made in the Mission Valley at Crow Creek, one at Polson at the foot of the Flathead lake, and one, the Pend d' Orielle River.

On this trip, the party all told, including the teamster and cook numbered fourteen. At Polson the teamster was returned to Missoula with accumulated material, the party going across the lake to the Station.

The work at the Station occupied the month of August. There was a decided advance in attendance, interest and results accomplished, as compared with the first year. The accompanying photographs show the location of the Station, with a view to the interior, showing the people at work.

The four weeks at the Station were devoted in part to giving instruction to those attending, in part to continuing the study and collection of the fauna and flora of the region. Soundings and dredgings were made in the Flathead lake, in Daphnia pond, and in Estey's pond. A side trip of two days was taken to the Swan Lake, where soundings and dredgings were made.

The return to the University was made September first. The material collected is now being worked over as fast as time will permit.

The attendance during the summer is as follows:

Collecting trip	11	
Station	13	
Total		24
Counted twice	7	
Total attendance		17

Material Collected—

500 bird skins.

About fifteen quarts of shells, nearly 25 species.

114 vials of microscopical life from the lakes and rivers.

Several hundred species of plants with a large number of specimens.

About 200 fish from the lakes and rivers.

125 photographic negatives, representing geology, physical geography and biology.

A partial collection of the woods of the state, 17 species being taken.

About 20 mammal skins.